

Peyronie's disease

Inflammatory disorder of tunica albuginea, originally described by Fallopius in 16th century; characterised by Francois de la Peyronie in 1743

Demographics

Incidence

Symptomatic incidence ~1%; probably increasing

Peak age

50-60 yrs

Aetiology

Unknown

Associations

Dupuytren's contracture (familial AD)

Ledderhose's disease (plantar fascial contracture)

Diabetes mellitus

Tympanosclerosis

Paget's disease of bone

Beta blockers

HLA-DQ5, HLA-A1, HLA-DQw2

Presentation (Classic quad, or other combination)

Pain

Plaque formation

Deformity

Erectile dysfunction (~one-third at presentation)

Natural history

Divided into 2 phases: initial acute phase followed by stable chronic phase. Typically acute phase lasts 12-18 months. Although mild improvement in deformity often seen, residual deformity common.

Gelbard 1998 (n=98; 5 yr follow-up)

42% worsening

44% stable

14% resolved

Pathophysiology

Pathophysiology unknown – current theory below (Somers and Dawson)

Tunica albuginea bilaminar – outer longitudinal layer and inner circular layer

Damage thought to occur due to buckling trauma at junction of septum and tunica. Intravasation of blood into 'new space' stimulates a inflammatory response. Poor vascularity prevents complete resolution and retention of

TGF-β1 perpetuating inflammatory response, with deposition of fibrosis.

Failed downregulation of antifibrotic matrix metalloproteinases also implicated

Patient evaluation

History taking

Sexual history (?IIEF)

Medical history

Examination

Photograph in erection

Dorsal penile length measurement

Penile plaque location and size

Other investigation

Role of vascular assessment undefined (doppler USS to exclude arterial insufficiency prior to straightening surgery) although few studies of benefit (Jordan 1993) and before PDE5i era

Conservative/medical management

Very poor evidence base for medical/conservative therapy in active phase. Few PC-RCT, therefore improved may simple reflect natural history.

Some evidence for potaba, intralesional interferon alpha, ESWL and possibly electromotive therapy

Vitamin E	200-300mg day Well tolerated with minimal side-effects Early non-randomised studies reported improved pain, plaque size and angulation (Largest Devine 1987 n=107) No evidence of benefit in RCTs however NB. at high doses vitamin E has anticoagulation effect
Potaba	Potassium aminobenzoate; member of vitamin B group, possibly an oxygen donor to monoamine oxidase Controversial One RCT showed no benefit One PC-RCT show modest improvement in pain, plaque size and curvature but no improvement in sexual function. Very poor compliance due to volume and frequency of drug dosing (3g qds) and GI side effects (Weidner 2005)
IFN-α	Intralesional interferon alpha 10MU q3wkly improved pain plaque size and curvature but not sexual function (Hellstrom 2006)
ESWL	Good for pain but little effect on other parameters. Hauck metaanalysis 2004
EMT	Electromotive therapy designed to overcome impermeability of tunica albuginea. 2 RCTs. Only one with follow-up 6 months. orgotein and DXM improved all 4 parameters (Montorsi). Recent well-conducted RCT of EM Verapamil showed no benefit (Greenfield 2007)

Surgery

Patients should have disease duration >1 yr and stable disease for >3 months. Generally patients should also have severe deformity causing penetration difficulty. Assessment of erectile function (IEEF score), degree of shortening (home length measurement) and angle of curvature (photo record) important considerations in patient work-up. **Choice of procedure between convex shortening (Nesbit /Yachia/ plication) or concave lengthening (plaque incision and grafting) with or without prosthesis insertion for ED.** Concave shortening proportional to deformity, but ED low. Convex lengthening good for length but higher rates of ED. Algorithm - Levine 1997 [modified by Ralph]:

Normal erection	<60% deformity	Nesbit
	>60% deformity	Graft
	complex	Graft +/- plication

Impaired erection	<60% deformity	Nesbit + PDE5i
	>60% deformity	Penile prosthesis*
	complex	Penile prosthesis*

*deformity often straightens with prosthesis, or with mild bending (modelling - only with AMS 700 or Mentor alpha-1). If residual deformity > 20% persists, plication necessary.

Nesbits

Described by Nesbit in 1965; adapted to Peyronie's disease by Pryor 1979
Reliable - straightening in 79-100% and satisfaction in 67-100% (Kadioglu 2006). 10% of curvature = 1mm of ellipse

Largest study Ralph 1995 (n=359; PDS for plication)

Mean follow-up 21 months

82% straight and happy

100% shortened; 4.7% >2cm; **1.6% too short to penetrate**

5% persistent curvature [early (suture cutting out) vs. late (Peyronie's progression)]

3% erectile dysfunction (all had ED beforehand)

Failure rate following Nesbits 7-21%. Early due to suture cutting out, later due to vicryl/monocryl. Higher rates of failure with plication procedures because depends upon suture strength without wound healing.

Other convex shortening operations:

1. Yachia 1990 - vertical to transverse corporoplasty

2. Plication

Originally described by Nesbit

Non-absorbable braided suture - Ethibond 2-0

Essed and Schroder 1985 - 8 dot plication

Gholami and Lue 2002 - 16 dot plication (2 pairs of sutures)

3. Plaque incision and grafting

Plaque excision and dermal graft associated with high recurrence and ED rates - abandoned in favour of incision and vein patch. Restoration of length achieved by freeing neurovascular bundle, plaque incision and grafting. Originally proposed using venous patch - Best paper El-Sakka and Lue 1998. Overall straightening in 75-96%, but immediate ED in 15% with satisfaction rates only 60% at 5 yrs, probably due to ED. Vein grafting requires donor site. Allografts used (bovine pericardium but no long-term data). Synthetic materials have problems with inflammation, fibrosis and infection.

Penile prostheses (see ED notes)

Malleable implants not favoured by patients. Inflatable prostheses preferred.

Good long-term satisfaction rates 79-100% with inflatables. Modelling with AMS 700CX and Mentor, plication for residual curvature > 20%.

Wilson 2001 reported results of prosthesis and modelling – urethral injury 5%, significantly higher than in non-PD patients